

XIII.—REPORT ON THE MARINE POLYZOA
IN THE COLLECTION OF THE
INDIAN MUSEUM.

By LAURA R. THORNELY.

INTRODUCTION.

The Polyzoa here described are derived from various sources, chiefly from the collections made by the Indian Marine Survey (R.I.M.S. "Investigator"), the late Mr. J. Wood-Mason, the late Dr. J. Anderson, and a few private donors. With the exception of a small number of specimens from Gaspar Straits and the Straits of Malacca, the whole of the material is from Indian seas.

The following is a list of the "Investigator" stations from which specimens are recorded :—

Station No.	Lat. N.	Long. E.	
58 ..	16° 30'	72°	15 fathoms.
" " 59 ..	6° 6' 30"	81° 23'	32 "
" " 61 ..	14° 54' 30"	93° 51'	41 "
" " 77 ..	Off Ganjam Coast	13 miles	
	E.S.E. Barwa	..	35 "
" " 79 ..	Off Ganjam Coast	10 miles	
	E.S.E. Kawita	..	33 "
" " 90 ..	Off Ganjam Coast	8 miles	
	E.S.E. Kalingapatam		28-30 "
" " 148	15-30 "
" " 197 ..	9° 26' 30"	75° 36' 30"	406 "
" " 255 ..	9° 26' 30"	91° 56' 30"	869-913 "
" " 327 ..	17° 7' 30"	94° 5' 30"	419 "
" " 331 ..	11° 46' 30"	93° 16'	569 "
" " 333 ..	6° 31'	79° 38' 45"	401 "
" " 346 ..	26° 37' 30"	53° 3' 30"	47 "

There are 81 species represented, four of which (a *Scrupocellaria*, a *Canda*, and two species of *Mucronella*) I consider new to science, while the following twenty-four are new to Indian waters: *Ætea recta*, *Caberea lata*, *Bugula ditrupæ*, *Synnotum aviculare*, *Flustra*

dentigera, *F. rhizophora*, *F. pisciformis*, *Carbasea cribriiformis*, *Cel-
laria tenuirostris*, *Membranipora tenuirostris*, *M. tuberculata*, *M.
radicifera*, *Thalamoporella smittii*, *Microporella malusii*, *Lagenipora
socialis*, *Schizoporella tenuis*, *Smittia marmorea*, *Mucronella canali-
fera*, *Retepora producta*, *R. monilifera*, *Adconella platalea*, *A. dis-
toma*, *Cellepora cylindriiformis*, *Bowerbankia caudata*. Many of
these species have been found in Australian waters.

Two species (*Bifaxaria*? and *Reteporella*?) are doubtful; while twenty-one have been already found in Indian seas. Of the latter, four were included in a list of fourteen species collected by Mr. Thurston in the Gulf of Manaar and described (*Madras Gov. Mus. Bull.*, No. 3, 1905) by Mr. Kirkpatrick; six were in the late Dr. J. Anderson's Mergui collection, named by Hincks in 1887 (*Journ. Linn. Soc. Zool.*, vol. xxi); six were identified by Hincks in a list of various collections from India, Singapore and Ceylon, recorded by him in his "Contribution towards a General History of the Marine Polyzoa" in the *Ann. Mag. Nat. Hist.*, series 5, vol. vi, and subsequent volumes; while one, *Membranipora bengalensis*, was described by the late Dr. F. Stoliczka in the *Journ. Asiat. Soc. Bengal*, part 2, vol. xxxviii, p. 55, 1869. All these species, with the exception of the last and of *Thalamoporella smittii*, were recorded by me, with thirty-eight others, in my report on the Polyzoa collected by Professor Herdman off the coast of Ceylon in 1902 (Suppl. Report XXVI to Herdman's *Ceylon Pearl Oyster Fisheries*, pt. iv).

Order ECTOPROCTA.

Sub-order CHEILOSTOMATA.

Family ÆTEIDÆ.

1. *Ætea recta*, Hincks.

Ann. Mag. Nat. Hist., series 3, vol. ix, p. 25, 1862.

Locality.—Andamans, growing on *Tubucellaria cereoides*.

Family CATENARIADÆ.

2. *Catenaria lafontii*, Aud.

Localities.—Ye, Burma; Marshall Channel, Andamans; Stations 59 and 77, Indian Marine Survey.

Family CELLULARIADÆ.

3. *Scrupocellaria scrupæa*, Busk.

Ann. Mag. Nat. Hist., series 2, vol. vii, p. 83, 1851.

Locality.—Off Mangalore, 26-31 fathoms (Indian Marine Survey).

4. *Scrupocellaria cervicornis*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. i, page 24.

Locality.—Pedro Shoal, 25 fathoms (Wood-Mason).

There is very little of this lovely species, but the glassy texture, the antler-like spines and the tracery on the fornix, also the perforated oœcia, are all beautifully represented.

5. *Scrupocellaria diadema*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. i, p. 24.

Localities.—Off Cheduba, 28-30 fathoms (Armstrong); Station 90, Indian Marine Survey.

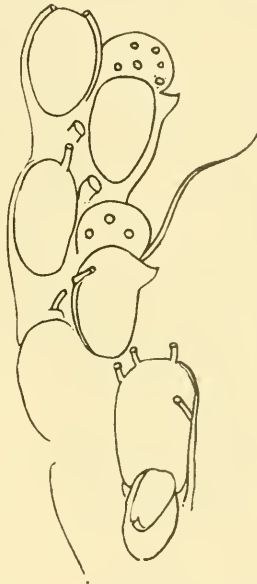
6. *Scrupocellaria gaspari*, sp. nov.

FIG. 1. —*Scrupocellaria gaspari*, sp. nov.

Zoœcium with oral aperture occupying two-thirds of its front wall, having a thick, smooth margin and four spines above. The open space below the aperture is narrowed downwards, supporting on one side a small, raised avicularium pointing outwards. This avicularium is replaced by a very large one on each of those zoœcia situated next below the fork of a branch. Lateral avicularia, small vibraculæ, no fornix. Oœcia perforated. Radical tubes serrated.

The present species resembles *S. ferox*, Busk (*Brit. Mus. Cat. Mar. Pol.*, pt. i) in the small lateral avicularia and the serrated radical tubes, but in *S. ferox* each zoœcium has a large avicularium below the aperture, while here they are small except on the zoœcia situated below the fork of a branch. Also, the zoœcia are armed, while those of *S. ferox* are unarmed.

Localities.—Gaspar Straits, Malay Archipelago; Andamans; Stations 59, 77, 90, Indian Marine Survey.

7. *Canda retiformis*, Pourtalès.

(*Caberia retiformis*) Smitt, "Floridan Bryozoa," pt. i, p. 16, in *Vetensk. Akad. Handl.*, vol. xi, 1872.

Localities.—Off Ceylon Coast, 32-34 fathoms; Andamans, 20-30 fathoms (Indian Marine Survey); Ye, Burma; Stations 59, 77, 148, Indian Marine Survey.

8. *Canda pecten*, sp. nov.

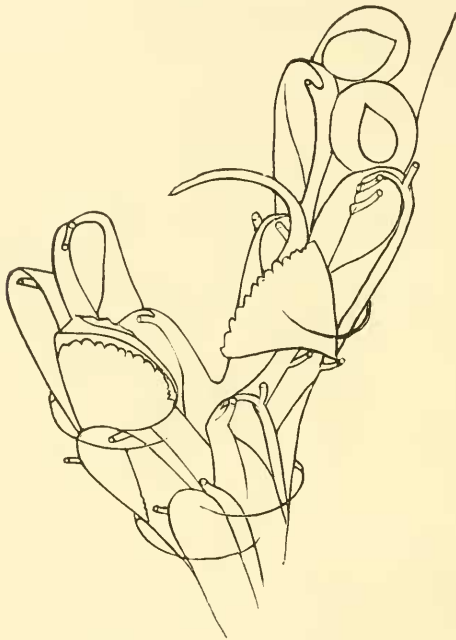


FIG. 2.—*Canda pecten*, sp. nov.

Zoecia oval, elongated, with thin, raised margin and a spine, rarely two, on either side above. Membranous area reaching half way down the front wall, a thin, calcareous, diagonal sheet covering the rest, no fornix or medium avicularium, except an enormous avicularium at the base of each fork of a branch which is raised on a large prominence, having frilled edges, and is long, narrow and pointed, directed downwards and inwards. Grooves of the vibraculum reach beyond the edge of the zoecia, behind. The junction of the connecting fibres is seen below these, and there are serrated rootlets near the bases of the colonies as in *Scrupocellaria ferox* and *S. macandrei*. Oecia lie back on the median line of the stem, one above the other, alternately, from their positions rather to one side

of the top of the zoecia to which they belong. They have a rounded, membranous portion in front and a sort of umbo, sometimes, above.
Localities.—Coast of Cheduba, 28-30 fathoms (Armstrong); Station 61, Indian Marine Survey.

9. *Caberea lata*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. i, p. 39.

Locality.—Gaspar Straits (J. S. Gardner)

Family BICELLARIIDÆ.

10. *Diplœcium simplex*, Kirkpatrick.

Ann. Mag. Nat. Hist., series 6, vol. i, p. 73, 1888.

Locality.—Off Passage Island, Andamans, 17 fathoms.

11. *Bugula ditrupæ*, Busk.

Quart. Journ. Micro. Sci., old series, vol. vi, p. 261, 1858.

Locality.—Andamans, 35 fathoms.

12. *Bugula neritina*, Linn.

These specimens have avicularia as in those mentioned in my report on the Polyzoa from Ceylon (Suppl. Report XXVI to Herdman's *Ceylon Pearl Oyster Fisheries*, pt. iv).

Locality.—Ye, Burma (Indian Marine Survey).

13. *Bugula sinuosa*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 39

Localities.—Eight miles S.E. of Cinque Island, 500 fathoms; Andamans, 780 fathoms.

Family NOTAMIIDÆ.

14. *Synnotum aviculare*, Pieper.

Hincks, *Ann. Mag. Nat. Hist.*, series 5, vol. xvii, p. 257, 1886.

Localities.—Marshall Channel, Andamans; Stations 59, 77, Indian Marine Survey.

Family FLUSTRIDÆ.

15. *Flustra dentigera*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. ix, p. 116, 1882.

A beautiful fan-shaped colony half an inch high by one and a quarter inches wide. Unfortunately no oecia are present.

Locality.—Andamans (Wood-Mason).

16. *Flustra rhizophora*, Ortman.

Die Japanische Bryozoen Fauna.

As in Ortman's description, there are no internal or lateral denticles. There are two, rarely four, spines above. Avicularia have the long, pointed mandibles which lie along one side of the zoëcia, beneath which is the area they originate from. Oœcia with the usual calcareous bar across the front are present. There are only a few fragmentary tips of branches of this species; they resemble the palmate form of *F. foliacea*, measuring three-fourths of an inch across.

Locality.—Off Mangalore, 26-31 fathoms (Indian Marine Survey).

17. *Flustra pisciformis*, Busk.

(*Carbæsea pisciformis*) *Brit. Mus. Cat. Mar. Pol.*, pt. i, p. 50.

This small colony agrees with Busk's description of the zoëcia and oœcia but has an occasional avicularium which has the same form as that of *F. securifrons*; the zoëcia are larger, however, than those of the British *F. securifrons*, and the species is altogether more like the description of *F. pisciformis*.

18. *Diachoris intermedia*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. viii, p. 133, 1881.

Localities.—Stations 59, 77, Indian Marine Survey.

19. *Carbæsea cribriiformis*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 58.

There are only a few fragments of this species in the collection, so that the spiral growth at the bases of fenestra cannot be seen; otherwise the characters agree with Busk's description.

Localities.—Stations 59, 61, 77, (72, 15, 34 fathoms,) Indian Marine Survey.

Family CELLARIIDÆ.

20. *Cellaria tenuirostris*, Busk.

(*Salicornaria tenuirostris*) *Brit. Mus. Cat. Mar. Pol.*, pt. i, p. 17.

There is only one specimen of this form, measuring about one inch in height and being well branched. Avicularia have shorter mandibles mentioned by Busk (*Voy. H.M.S. "Challenger,"* pt. xxx (vol. x), p. 92). The internodes are swollen with the number of oœcia present, and the opening to these, above the orifice is oval with a spade-shaped operculum. The knots of radical tubes, alluded to by Smitt ("Floridan Bryozoa," pt. ii, p. 4, in *Vetensk. Akad. Handl.*, vol. xi, 1872), are to be seen where each branch is given off.

21. *Nellia oculata*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. i, p. 18.

Localities—Gaspar Straits; Stations 59, 77, 90, Indian Marine Survey; Andamans (Wood-Mason).

Family TUBUCELLARIIDÆ.

22. *Tubucellaria ccreoides*, Ellis and Sol.

MacGillivray, *Trans. Roy. Soc. Vict.*, vol. xxi, p. 107, 1884.

Localities.—Off Table Island, Andamans (Indian Marine Survey); Andamans, 130-250 fathoms; west coast Andamans (Wood-Mason).

Family MEMBRANIPORIDÆ.

23. *Membranipora tenuirostris*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. vi, p. 70, 1880.

Locality.—Lat. 6° 1' N., Long. 81° 16' E., 34 fathoms (Indian Marine Survey); Andamans (Wood-Mason).

24. *Membranipora tuberculata*, Busk.

Quart. Journ. Micro. Sci., old series, vol. vi, p. 126, 1858.

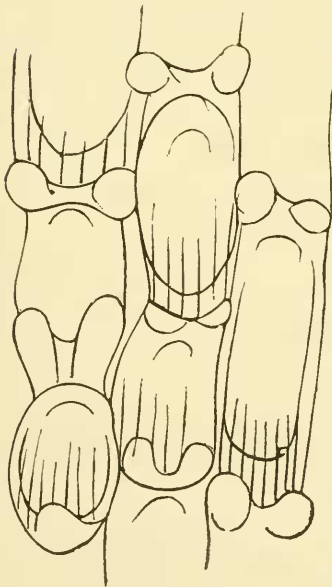


FIG. 3.—*Membranipora tuberculata*, Busk

There is a point that makes me hesitate in considering this species to be *M. tuberculata*. The blunt tubercles are hollowed in a cave-like manner on the side nearest the basis of the zoecia, and the membrane of the front wall of the zoecium can be sometimes seen extending below the aperture, over the margin, which has become widened and attached to the tubercles above the hollowed portions. These tubercles with age become united to form a transversely elongated tubercle, as described by Busk for *M. tuberculata*. This species should probably be called *Amphiblestrum* instead of *Membranipora*.

Locality.—Station 327, Indian Marine Survey.

25. *Membranipora bengalensis*, Stoliczka.

Journ. Asiat. Soc. Bengal, vol. xxxviii, pt. 2, p. 55, 1869.

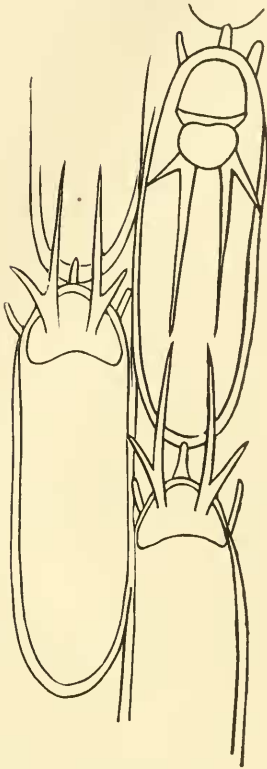


FIG. 4.—*Membranipora bengalensis*, Stol.

The spines described by Stoliczka as proceeding downwards from the lower lip are in these specimens situated on the operculum; they appear as if proceeding from the lower lip when the operculum is open, but stand upright when it is closed. There are no lateral spines present on these specimens, but on either side of the usual basal spine there is one not mentioned in the original description.

Locality.—Snod Island.

26. *Membranipora radificifera* var. *intermedia*, Kirkpatrick.

Proc. Roy. Dub. Soc., vol. vi, new series, p. 615, 1890.

Locality.—Cheduba, 6 fathoms.

27. *Membranipora coronata*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. vii, p. 147, 1881.

Localities.—Lat. $6^{\circ} 1' N.$, Long. $81^{\circ} 16' E.$, 34 fathoms; off Port Blair, 100 fathoms (Indian Marine Survey); Marshall Channel, Andamans (Indian Marine Survey).

28. *Membranipora delicatula*, Busk.

Hincks, *Ann. Mag. Nat. Hist.*, series 5, vol. vi, p. 86, 1880.

A small colony closely adhering to a stick.

Locality.—Off Mangalore, 26-31 fathoms.

Family MICROPORIDÆ.

29. *Steganoporella simplex*, Harmer.

Quart. Journ. Micro. Sci., vol. xliii, p. 253, 1900.

Locality.—Lat. $6^{\circ} 1' N.$, Long. $81^{\circ} 16' E.$, 34 fathoms (Indian Marine Survey).

30. *Steganoporella sulcata*, Harmer.

Quart. Journ. Micro. Sci., vol. xliii, p. 246, 1900.

Locality.—Off Table Island, Andamans (Indian Marine Survey).

31. *Thalamoporella smittii*, Hincks.

Journ. Linn. Soc., vol. xxi p. 123, 1889.

Locality—Pedro Shoal, 25 fathoms.

32. *Bifaxaria*? sp.

FIG. 5.—*Bifaxaria*? sp.

A fragment, measuring half an inch in height, probably belonging to this genus, has a continuous, branched, calcareous zoarium, composed of zoecia united back to back, divisions between them very indistinctly seen. Orifice rounded with a loop-shaped sinus deeply sunk, but its primary form continuous up to the surface of the zoarium. A few, scattered, rounded avicularia round the margins of the zoecia.

Locality.—Lat. 5° 56' N., Long. 91° 05' E., 1,590 fathoms (Wood-Mason).

33. *Cribrilina radiata*, Moll.

Localities.—Lat. 6° 1' N., Long. 81° 16' E., 34 fathoms; coast of Cheduba, 28-30 fathoms (Armstrong); Cheduba, 6 fathoms; Station 90, Indian Marine Survey.

Family MICROPORELLIDÆ.

34. *Microporella ciliata*, Pallas.

These specimens have the wing-like modification of the avicularia mentioned by Hincks (*Ann. Mag. Nat. Hist.*, vol. ix, p. 24, 1882) as having been found by Captain Cawne Warren on the coast of Ceylon.

Localities.—Stations 59 and 77, Indian Marine Survey.

35. *Microporella violacea* form *plagiopora*, John.

Hincks, *Brit. Marine Pol.*, vol. i, p. 216.

Locality.—Cheduba, 6 fathoms.

36. *Microporella malusii*, Aud.

Locality.—Lat. 6° 1' N., Long. 81° 16' E., 34 fathoms (Indian Marine Survey).

37. *Chorizopora brongniartii*, Aud.

Localities.—Lat. 6° 1' N., Long. 81° 16' E., 34 fathoms; Cheduba, 6 fathoms.

Family PORINIDÆ.

38. *Lagenipora spinulosa*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. xiii, pp. 57 and 210, 1884.

Locality.—Andamans (Wood-Mason).

39. *Lagenipora socialis*, Hincks.

Ann. Mag. Nat. Hist., series 4, vol. xx, p. 215, 1877.

The colonies of this species are in the form of little caps which appear to have encrusted some round body and from which they are broken off. The zoecia radiate from a hole in the centre which is occupied in some cases by the stem of a branching red coral. The tubular orifice of the zoecium has often spinous processes behind. The specimens differ from Hinck's description in having a roughened instead of a smooth wall to the oecia, and in having perforations scattered over the whole front wall of the zoecium.

Locality.—Andamans.

40. *Lagenipora tuberculata*, MacGil.

McCoy, *Prodromus Zool. Vict.*, decade xvi, vol. ii, p. 209.

Locality.—Lat. 6° 1' N., Long. 81° 16' E. (Indian Marine Survey).

Family MONOPORELLIDÆ.

41. *Monoporella albicans*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. ix, p. 123, 1882.

There is a purplish tinge to these colonies, caused by the dark colour of the operculæ as in *Cellepora albirostris* (Smitt "Floridan Bryozoa," pt. ii, p. 70, in *Vetensk. Akad. Handl.*, vol. xi, 1872).

Locality.—Marshall Channel, Andamans (Indian Marine Survey).

42. *Monoporella lepida*, Hincks.

(*Haploporella lepida*) *Ann. Mag. Nat. Hist.*, series 5, vol. viii, p. 11, 1881.

Locality.—Lat. 6° 1' N., Long. 81° 16' E., 34 fathoms (Indian Marine Survey).

Family MYRIOZOIDÆ.

43. *Schizoporella tenuis*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 165.

The present specimens must be much finer colonies than those described by Busk. The zoarium is free, forming hollow tubular branches which expand into funnel-shaped ends whose sides sometimes fall in, forming various convolutions, and as growth proceeds the branches meet and unite so as to make a confused, interlaced colony. These colonies are of very delicate texture and pearly white in early stages of growth, becoming more substantial and of a shiny, pinkish colour with age. Oœcia are present very large, each nearly covering the zoœcium above the one to which it belongs. The orifices of fertile zoœcia are about twice as large as those of ordinary zoœcia.

Localities.—Off Passage Island, Andamans, 17 fathoms; Marshall Strait, Table Island.

44. *Schizoporella nivea*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 163.

Locality.—Andamans (Wood-Mason).

45. *Schizoporella aperta*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. ix, p. 126, 1882.

These specimens correspond with those brought by Professor Herdman from Ceylon and recorded by me (in Suppl. Report XXVI to Herdman's *Ceylon Pearl Oyster Fisheries*, pt. iv). They have two spines on the upper margin of the orifice not mentioned by Busk. Oœcia are present here, not in the Ceylon collection. The beaks of the large avicularia are not serrated as described by Hincks (*Ann. Mag. Nat. Hist.*, series 5, vol. ix).

Localities.—Coast of Cheduba, 28-30 fathoms (Armstrong); 8 miles E.S.E. Kalingapatam, 28-30 fathoms.

46. *Schizoporella spongitis*, Pallas.

Locality.—Pedro Shoal, 25 fathoms.

47. *Schizoporella incrassata*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. ix, p. 124, 1882.

The frontal, large avicularia have on this specimen forked mandibles instead of pointed. Other characters correspond with Hincks' description, but there are no oœcia to help in the identification of the species.

Locality.—Off Ceylon coast, 32-34 fathoms (Indian Marine Survey).

48. *Schizoporella cecilii*, Aud.

Hincks, *Brit. Marine Pol.*, vol. i, p. 269.

Locality.—Pedro Shoal, 25 fathoms.

49. *Rhyncozoon incisor*, Thornely.

Suppl. Report XXVI to Herdman's *Ceylon Pearl Oyster Fisheries*,
pt. iv.

Locality.—Lat. $6^{\circ} 1' N.$, Long. $81^{\circ} 16' E.$, 34 fathoms (Indian Marine Survey).

50. *Gemellipora glabra* form *striatula*, Smitt.

"Floridan Bryozoa," pt. ii, p. 37, in *Vetensk. Akad. Handl.*, vol. xi, 1872.

Locality.—Cheduba, 6 fathoms.

Family ESCHARIDÆ.

51. *Lepralia cucullata*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. ii, p. 81.

Localities.—Galle (Dr. J. Anderson); Cheduba, 6 fathoms.

52. *Lepralia fuegensis*, Busk.

(*Eschara fuegensis*) *Brit. Mus. Cat. Mar. Pol.*, pt. ii, p. 90.

Locality.—Marshall Channel, Andamans (Indian Marine Survey).

53. *Lepralia adpressa*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. ii, p. 82.

Locality.—Lat. $6^{\circ} 1' N.$, Long. $81^{\circ} 16' E.$, 34 fathoms (Indian Marine Survey).

54. *Lepralia multidentata*, Thornely.

Suppl. Report XXVI to Herdman's *Ceylon Pearl Oyster Fisheries*,
pt. iv, p. 120.

Locality.—Lat. $6^{\circ} 1' N.$, Long. $81^{\circ} 16' E.$, 34 fathoms (Indian Marine Survey).

55. *Lepralia turrata*, Smitt.

"Floridan Bryozoa," pt. ii, p. 65, in *Vetensk. Akad. Handl.*, vol. xi, 1872.

Locality.—Station 58, Indian Marine Survey

56. *Lepralia poissonii*, Aud.

Hincks, *Ann. Mag. Nat. Hist.*, series 5, vol. viii, p. 122, 1881.

Locality.—Andamans, 120 fathoms (Indian Marine Survey).

57. *Porcella malleolus*, Hinck.

Ann. Mag. Nat. Hist., series 5, vol. xiii, p. 361, 1884.

Locality.—Pedro Shoal, 25 fathoms.

58. *Smittia marmorca*, Hincks.

Brit. Marine Pol., vol. i, p. 350.

Locality.—Coast of Cheduba, 28-30 fathoms (Armstrong).

59. *Smittia rostriformis*, Kirkpatrick.

Ann. Mag. Nat. Hist., series 6, vol. i, p. 80, 1888.

Locality.—Station 90, Indian Marine Survey.

60. *Smittia trispinosa*, Johnston.

Several varieties of this species.

Localities.—Kilakarai, Gulf of Manaar (Anmandale); Station 90, Indian Marine Survey.

61. *Mucronella canalifera*, Busk.

Waters, *Voy. H.M.S. "Challenger,"* pt. lxxix (vol. xxxi), p. 24.

I have some hesitation in considering the present specimen to be *M. canalifera*. It has the characteristic features of upright zoëcia, with finely punctured surface, semiorbicular orifice, without a tooth, spines above and at the sides of the orifice, and a spout-like lower lip. This last is, however, not so prominent as in Busk's figure, the spines usually number four, sometimes five, but not six, and are jointed at their bases; also there are, here and there, large pointed avicularia not described by Busk. No oëcia are present.

Locality.—Marshall Channel, Andamans (Indian Marine Survey).

62. *Mucronella tubulosa*, Hincks.

Ann. Mag. Nat. Hist., series 5, vol. vi, p. 383, 1880.

Locality.—Marshall Channel, Andamans (Indian Marine Survey).

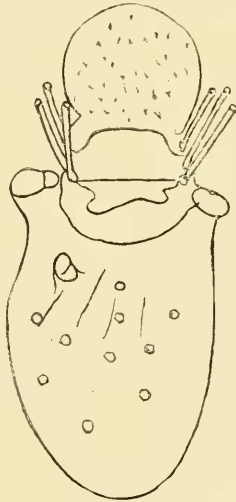
63. *Mucronella formidabilis*, sp. nov.

FIG. 6.—*Mucronella formidabilis*, sp. nov.

Zoarium incrusting, of a light brown colour. Zoëcia large, deeply divided, rising from the base to the orifice, coarsely and

regularly punctured. Orifice large, arched above, contracted near the base, with a point there on either side below the hinge of the operculum. Six to eight large, jointed spines above, six of which show in front of the oecium when present. Peristome rising below the orifice into a swollen hollow process with an avicularium on its inner aspect lying horizontally and having a tongue-shaped mandible. Numerous protuberances bearing small, rounded avicularia scattered over the front wall of the zoecium and round the margin of the orifice, sometimes reduced to two or three only. Oecia finely punctured, their sides prolonged downwards, leaving a square opening.

Locality.—N. Sentinel bearing N. 15 miles, W. 18 miles, 250 fathoms; growing on the cast spine of a sea-urchin.

There are resemblances between this species and *Mucronella vultur* and *M. aviculifera*, but there is the great distinction here of no internal denticle to the orifice.

64. *Mucronella maculata*, sp. nov.

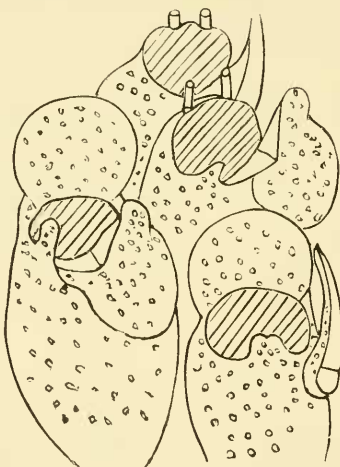


FIG. 7.—*Mucronella maculata*, sp. nov.

Zoarium incrusting, loosely attached to sea weed. Zoecia large, distinct, deeply divided. Surface finely granulated. Orifice rounded above, narrowing gradually to a point below, usually two spines above, a large mucro below, either in the centre or to one side according to the form of a prominence bearing an avicularium which is usually large and rounded, with a horizontally placed avicularium and occupying a large space rather to one side of the centre of the orifice pushing the mucro to one side; it is sometimes, however, produced into a narrow, curved process which stands straight up on one side of the orifice, the avicularium long and pointing upwards. There is sometimes a second similar avicularium on the other side of the orifice. When this form of avicularium is present the mucro holds its central position. A third form of

avicularium is borne on a spout-like protuberance of the front wall of the zoëcium, and is an addition, not a substitute for the others. Oœcia are large and rounded and granulated, like the walls of the zoëcia.

Locality.—Pedro Shoal, 25 fathoms

65. *Retepora tubulata*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 121.

In the "Challenger" report, one distinction given between this species and *R. philippinensis* is that the celluliferous surface of the zoarium is in the latter outside, instead of inside the tubular alveolæ. In the present specimen the first wide, vase-shaped fold of the zoarium has the celluliferous surface on its inside aspect, but the tubular branches, rising from this, have the celluliferous surface on their outside surface. Oœcia are plentiful and the forked avicularia is present at the bases of many of the fenestræ.

Localities.—Gaspar Straits (J. S. Gardner); Stations 59, 77, Indian Marine Survey; southern portion of Malacca Straits (S.S. "Sherard Osborne").

66. *Retepora producta*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 108.

Locality.—Pedro Shoal, 25 fathoms.

67. *Retepora monilifera*, MacGil.

Trans. Roy. Soc. Vict., vol. xx, p. 105, 1883.

A fragment, which corresponds generally with MacGillivray's species, as described in McCoy's *Prod. Zool. Vict.*, vol. i, decade x, p. 19, has three very marked features. 1. The enormous avicularia, ending in sharp points, which are placed in front and at the bases of most fenestræ of the zoarium. They pass right through the opening, and the rostrum has a tooth on either side of where the point of the mandible rests. 2. The very prominent oœcia which stand up almost at right angles to the orifice of the zoëcia and end in a point, formed by the tip of the vertical portion of the beaded band on the front wall of the oœcium. 3. The large, raised avicularia with short, curved mandibles present on the front wall of some zoëcia. Of these features the long pointed avicularia agree with MacGillivray's form *Munita*, except that they are situated at the bases of, not above, fenestræ. In the forward bend of the vertical beaded line on the oœcia, there is a resemblance to form *Sinuata*. There appears to be no absolute agreement with any one form mentioned.

Locality.—Station 148, Indian Marine Survey.

68. *Retepora pocillum*, Thornely.

Suppl. Report XXVI to Herdman's *Ceylon Pearl Oyster Fisheries*, pt. iv, p. 125.

Localities.—Off the coast of Ceylon, 32-34 fathoms (Indian Marine Survey); Lat. $6^{\circ} 1' N.$, Long. $81^{\circ} 16' E.$, 34 fathoms (Indian Marine Survey).

69. *Reteporella* ? sp.

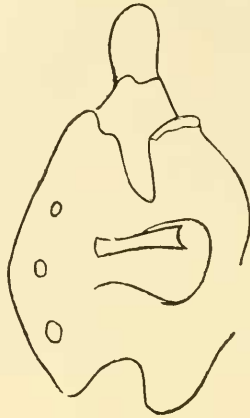


FIG. 8.—*Reteporella* ? sp.

Zoarium branched, surface glistening, zoecia smooth, with large pores here and there round the margin. The front wall rising from the base upwards to rather prominent shoulder-like projections on either side of the orifice. Primary orifice with two teeth near the base, sometimes meeting and leaving a pore below them. Secondary orifice with a much raised peristome, cleft in front. A large avicularium ending in two points, raised on an eminence and lying across the front of some zoecia.

Locality.—Off west coast, Andamans, 290-238 fathoms (Carpenter).

There is a general resemblance between this species and Smitt's ("Floridan Bryozoa," pt. ii, p. 67) *Retepora marsupiata*, but the fragment in the present collection indicates a branched, possibly a reticulate zoarium but not fenestrated, and the characters of the primary orifice and of the avicularia do not agree with those of that species.

Family ADEONIDÆ.

70. *Adconella subsulcata*, Smitt.

(*Porina subsulcata*) "Floridan Bryozoa," pt. ii, p. 28, in *Vetensk. Akad. Handl.*, vol. xi, 1872.

Localities.—Off Sentinel Island (?), 13 fathoms; Marshall Channel, Andamans (Indian Marine Survey).

71. *Adconella platalea*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 184.

Localities.—Ye, Burma coast; Gregory Island (Indian Marine Survey).

72. *Adeonella distoma*, Busk.

(*Lepralia distoma*) *Quart. Journ. Micro. Sci.*, old series, vol. vi, p. 127, 1858.

The present specimens are old, with thick calcareous walls the perforated area much sunk. There are more pores in some zoëcia than are described by Busk, and here and there on a separate area below the zoëcia there is a small avicularium, pointing downwards.

Locality.—Station 61, Indian Marine Surve

Family CELLEPORIDÆ.

73. *Cellepora cylindriiformis*, Busk.

Voy. H.M.S. "Challenger," pt. xxx (vol. x), p. 201.

The base of this specimen has evidently incrustated some cylindrical object. It has all the characters described by Busk, but is a much larger colony, rising free and branched to the height of half an inch.

Locality.—Andamans, 130-25 fathoms (Indian Marine Survey).

74. *Cellepora megasoma*, MacGil

(*Lepralia megasoma*) McCoy, *Prod. Zool. Vict.*, decade iv, vol. i, p. 33.

Localities.—Stations 59, 79, 90, Indian Marine Survey; Pedro Shoal, 25 fathoms.

75. *Cellepora cidaris*, MacGil

McCoy, *Prod. Zool. Vict.*, decade xvii, vol. ii, p. 243.

There are large colonies of what I believe to be this form, although they have solid instead of hollow columnar processes as described by MacGillivray

Localities —Off Ceylon coast, 32-34 fathoms (Indian Marine Survey); off Port Blair, 100 fathoms (Indian Marine Survey); Lat. 6° 1' N., Long. 81° 16' E. (Indian Marine Survey); Stations 59, 77, Indian Marine Survey.

Sub-Order CYCLOSTOMATA.

Family CRISIDÆ.

76. *Crisia holdsworthii*, Busk.

Brit. Mus. Cat. Mar. Pol., pt. iii, p. 7.

Localities.—Off Ceylon coast, 32-34 fathoms (Indian Marine Survey); Lat. 6° 1' N., Long. 81° 16' E., 34 fathoms (Indian Marine Survey).

77. *Idmonea milneana*, d'Orb.

Locality.—Station 148, Indian Marine Survey.

Sub-Order CTENOSTOMATA.

Family VESICULARIIDÆ.

78. *Amathia distans*, Busk.

Voy. H.M.S. "Challenger," Pt. I, (vol. xvii), p. 33.

Localities.—Coast of Cheduba, 28-30 fathoms (Armstrong); Andamans (Wood-Mason).

79. *Bowerbankia caudata*, Hincks.

(*Valkeria caudata*) *Ann. Mag. Nat. Hist.*, series 4, vol. xx, p. 215, 1877.

Locality.—Port Canning, Ganges Delta, incrusting bricks in brackish pool (Annandale).

80. *Farrella atlantica*, Busk.

Voy. H.M.S. "Challenger," Pt. I, (vol. xvii), p. 37.

Locality.—Ye, Burma (Indian Marine Survey).

Family CYLINDRÆCIDÆ

81. *Cylindræcium dilatatum*, Hincks.

Brit. Marine Pol., vol. i, p. 536.

These specimens have large, spinous dilatations at their bases, as described by Hincks for some of his specimens.

Locality.—Mangalore, 26-31 fathoms (Indian Marine Survey).